Trendy Study 10R-2-00

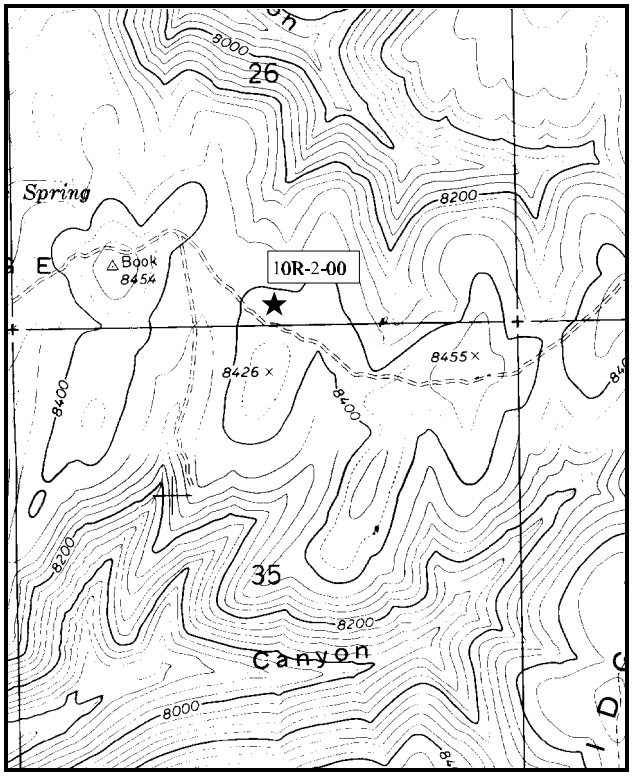
Study site name: Lone Spring Range Type: Mixed Mountain Brush

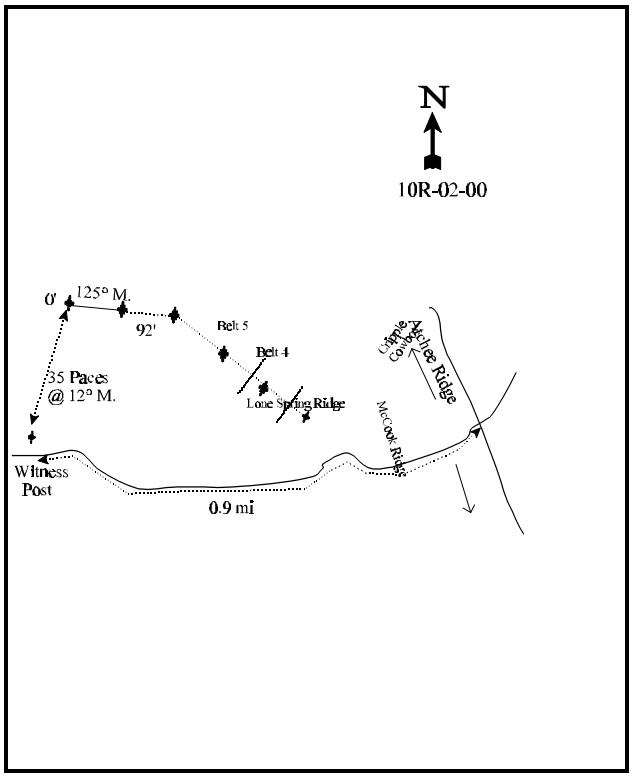
Compass bearing: frequency baseline 125°M. (Line 3 118°M, line 4 107°M)

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (95ft), line 5 (71ft).

LOCATION DESCRIPTION

From the intersection of McCook Ridge road, Atchee Ridge, Cripple Cowboy and Lone Spring Ridge, travel west on Lone Spring Ridge for 0.9 miles to a witness post on the right (north) side of the road. From the witness post walk 35 paces at 12°M to the 0-foot stake. The 0-foot stake is marked with a red browse tag numbered 93.





Map name: Rat Hole Ridge Diagrammatic Sketch

Township 5S , Range 104 E, Section 26 UTM 4383741.336 N, 668527.585 E

DISCUSSION

Trend Study 10R-2

The Lone Spring study was established in 1997 to monitor perceived conflicts over elk and livestock use on the North Book Cliffs. It samples a mountain brush site located on the east-west running Lone Spring Ridge which is relatively flat on top. Elevation at the site is approximately 8,100 feet. Aspect is northwest with a minimal slope of 2% to 3%. North of the site is a small aspen stand which deer were observed in when the study was established. The site is dominated by scattered, very large clumps of serviceberry averaging nearly 7 feet in height with 7 foot crowns. Pellet group transect data from 1997 indicated 21 elk, 17 cow, and 7 deer days use/acre (52 elk, 42 cow and 17 deer days use/ha). Data from the 2000 reading estimate 28 elk, 7 cow and 9 deer days use/acre (69 elk, 17 cow and 22 deer days use/ha). All of the deer pellet groups and about 25% of the elk pellet groups encountered in 2000 were from spring. All of the cow pats were from the previous grazing season. This area is within the Atchee Ridge allotment which permits cattle grazing from June through September on a deferred rest rotation basis.

Soil on the site is moderately deep but variable. Average effective rooting depth (see methods) is just over 14 inches with a stony profile encountered at 9 inches below the soil surface. Areas of bare soil have significantly more shallow soil depths of about 4 to 6 inches. Soil parent material is sandstone and texture is a clay loam with a neutral pH. Calcium carbonate coating of rocks is evident within the soil profile. The soil is well protected by vegetation and litter cover with little apparent erosion problems.

Very large Utah serviceberry dominate the site. They average 7 feet in height but many are in the 12 to 15 foot height class making many only partly available to browsing. Serviceberry provided 37% of the browse cover in 1997 with an estimated density of 660 plants/acre. Use was moderate on available plants but vigor was good and young plants common. During the 2000 reading, density of serviceberry increased to 840 plants/acre, 64% of which were classified as young. They show mostly light use and currently (‘00) provide 44% of the browse cover. Average leader growth of serviceberry is fairly low at only 2 to 4 inches due to dry conditions in 2000.

Mountain big sagebrush and snowberry dominate the understory. Density of sagebrush was estimated at 1,980 plants/acre in 1997. The majority (63%) were mature plants. Use was moderate, vigor good and percent decadence low at only 16%. In 2000, density increased to 3,280 plants/acre primarily due to a large increase in young plants which currently account for 41% of the population. Use is light and percent decadence slightly higher at 21%. Many of the mature and decadent sagebrush appear to be quite old with some showing partial crown death which can be caused by winter injury, coupled with drought. About half of the decadent plants were classified as dying (vigor class 4). Many of the plants in poor vigor are growing on more shallow soil of about 8 to 10 inches in depth compared to slightly deeper soil of about 12 to 14 inches where more healthy plants are found. Average leader growth for sagebrush is about 4 inches. Some additional forage is offered by the moderately abundant snowberry. It displayed mostly light use in 1997 and the majority appeared unutilized in 2000.

The herbaceous understory provides fairly uniform and abundant cover. Kentucky bluegrass dominates the grasses by providing 63% of the grass cover in 1997 and 73% in 2000. Other common grasses include thickspike wheatgrass and a sedge. Forbs are abundant and diverse and produce more cover than grasses. However, many are low growing, prostrate species like desert and long leaf phlox, mat penstemon, cinquefoil and sulfur eriogonum. Desert phlox is the most abundant forb. It provided 45% of the forb cover in 1997 and 53% in 2000. Looseflower milkvetch is also common and accounted for 24% of the forb cover in 1997 and 18% in 2000.

1997 APPARENT TREND ASSESSMENT

Bare ground cover is low with no apparent erosion. Vegetation and litter provide good protective ground cover. Utilization of the browse species is moderate with some of the grass species (Kentucky bluegrass and muttongrass) showing utilization as well. Some of the serviceberry plants are so large that they are not fully available to wildlife. Most of the use appears to be on the mountain big sagebrush. The grasses and forbs are abundant and diverse, but the composition is dominated by Kentucky bluegrass and low growing forbs.

2000 TREND ASSESSMENT

Trend for soil is stable with abundant protective ground cover and limited unprotected bare ground. Vegetative and litter cover increased since 1997, while percent cover of bare ground increased slightly. Trend for the key browse species, serviceberry and mountain big sagebrush is up. Density of both species increased, use declined and young recruitment has increased. The dry conditions of 2000 have reduced leader growth and vigor of sagebrush. Percent decadence has increased from 16% to 21% and half of the decadent sagebrush (340 plants/acre) are classified as dying. However, young plants account for 41% of the population and there are more than enough to replace decadent and dying plants at this time. Trend for the herbaceous understory is stable. Sum of nested frequency for grasses and forbs have remained similar to 1997. Nested frequency of Kentucky bluegrass increased significantly with frequency of the most abundant forbs remaining stable.

TREND ASSESSMENT
soil - stable (3)
browse - up (5)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 10R, Study no: 2

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'97	'00	'97	'00	'97	'00
G	Agropyron dasystachyum	232	*150	71	46	2.51	3.26
G	Agropyron trachycaulum	-	*12	-	5	-	.12
G	Bromus inermis	5	-	1	-	.03	-
G	Carex spp.	75	78	30	33	2.04	1.39
G	Festuca ovina	-	*13	-	7	-	.33
G	Koeleria cristata	5	-	2	-	.03	-
G	Poa fendleriana	23	16	9	7	.22	.13
G	Poa pratensis	275	*356	68	87	8.66	14.96
G	Sitanion hystrix	-	*20	-	10	-	.27
G	Stipa columbiana	-	2	-	1	-	.00
G	Stipa comata	14	8	6	4	.15	.12
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		629	655	187	200	13.67	20.61
Total for Grasses		629	655	187	200	13.67	20.61

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'97	'00	'97	'00	'97	'00
F	Agoseris glauca	4	11	2	4	.01	.05
F	Antennaria rosea	1	6	1	2	.03	.03
F	Androsace septentrionalis (a)	-	3	3	2	.39	.01
F	Arabis spp.	-	*6	-	4	-	.07
F	Astragalus tenellus	178	151	62	63	6.04	6.15
F	Aster spp.	-	*16	-	9	-	.12
F	Castilleja flava	5	6	2	3	.01	.18
F	Chaenactis douglasii	-	1	-	1	-	.00
F	Comandra pallida	1	2	1	2	.00	.03
F	Crepis acuminata	18	25	10	13	.16	.38
F	Delphinium bicolor	14	*-	6	-	.04	-
F	Erigeron eatonii	140	*72	53	35	1.15	.77
F	Eriogonum spp.	-	2	-	1	-	.03
F	Eriogonum umbellatum	194	183	65	65	3.72	3.84
F	Haplopappus acaulis	-	1	-	1	-	.00
F	Hackelia patens	-	4	-	2	-	.01
F	Lupinus argenteus	4	5	3	3	.07	.48
F	Lychnis drummondii	-	*6	-	4	-	.02
F	Penstemon caespitosus	19	32	9	14	.46	.61
F	Pedicularis centranthera	2	-	2	-	.01	-
F	Penstemon watsonii	49	46	20	20	1.08	.40
F	Phlox austromontana	275	245	78	63	11.18	17.89
F	Phlox longifolia	-	*47	-	14	-	1.74
F	Polygonum douglasii (a)	14	-	6	-	.08	-
F	Potentilla gracilis	11	11	4	4	.09	.48
F	Potentilla pennsylvanica	-	7	-	3	-	.21
F	Taraxacum officinale	47	*21	23	10	.45	.22
F	Thlaspi montanum	-	*11	-	6	-	.03
F	Tragopogon dubius	-	-	-	-	-	.00
Total for Annual Forbs		14	3	9	2	0.47	0.00
Total for Perennial Forbs		962	917	341	346	24.54	33.80
Total for Forbs		976	920	350	348	25.01	33.81

* Indicates significant difference at % = 0.10

BROWSE TRENDS --
Herd unit 10R, Study no: 2

Type	Species	Strip Frequency '97	Strip Frequency '00	Average Cover % '97	Average Cover % '00
B	Amelanchier utahensis	23	25	9.53	12.88
B	Artemisia tridentata vaseyana	57	70	7.21	5.68
B	Chrysothamnus viscidiflorus viscidiflorus	3	8	.15	.19
B	Quercus gambelii	0	1	-	.00
B	Symphoricarpos oreophilus	66	63	9.02	10.67
Total for Browse		149	167	25.92	29.44

CANOPY COVER --
Herd unit 10R, Study no: 2

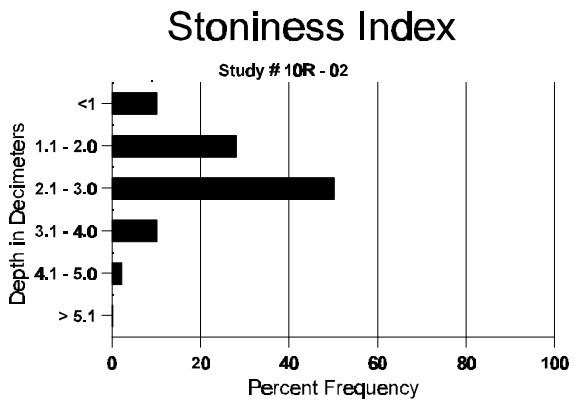
Species	Percent Cover '00
Amelanchier utahensis	2

BASIC COVER --
Herd unit 10R, Study no: 2

Cover Type	Nested Frequency '97	Nested Frequency '00	Average Cover % '97	Average Cover % '00
Vegetation	470	460	52.68	69.53
Rock	31	16	.33	.38
Pavement	72	51	.31	.25
Litter	499	484	63.95	72.55
Cryptogams	58	32	.68	.46
Bare Ground	176	232	8.10	12.21

SOIL ANALYSIS DATA --
Herd Unit 10R, Study no: 02

Effective rooting depth (inches)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.6	57.6 (14.9)	6.7	31.0	37.8	31.2	4.98	7.15	153.6	0.65



PELLET GROUP FREQUENCY --
Herd unit 10R, Study no: 2

Type	Quadrat Frequency		Pellet Transect			
			Pellet Groups per Acre		Days Use per Acre (ha)	
	'97	'00	'97	'00	'97	'00
Rabbit	1	1	-	9	N/A	N/A
Sage Grouse	-	1	-	-	-	-
Elk	9	14	278	358	7 (17)	27 (68)
Deer	7	1	87	113	21 (52)	9 (22)
Cattle	-	3	200	87	17 (42)	7 (18)

BROWSE CHARACTERISTICS --
Herd unit 10R, Study no: 2

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	97	5	4	-	5	-	-	-	-	-	14	-	-	-	280			14
	00	27	-	-	-	-	-	-	-	-	27	-	-	-	540			27
M	97	5	5	2	4	3	-	-	-	-	18	-	-	1	380	83	79	19
	00	13	1	-	1	-	-	-	-	-	15	-	-	-	300	89	106	15
X	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'97	36%	06%	03%	+21%
'00	02%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'97	660	Dec:	-
	'00	840		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	26	-	-	-	-	-	-	-	-	26	-	-	-	520			26
Y	97	21	-	-	-	-	-	-	-	-	21	-	-	-	420			21
	00	68	-	-	-	-	-	-	-	-	68	-	-	-	1360			68
M	97	9	45	8	-	-	-	-	-	-	62	-	-	-	1240	26	32	62
	00	55	6	-	-	-	-	-	-	-	61	-	-	-	1220	27	34	61
D	97	4	9	3	-	-	-	-	-	-	11	-	-	5	320			16
	00	31	2	-	2	-	-	-	-	-	18	-	-	17	700			35
X	97	-	-	-	-	-	-	-	-	-	-	-	-	-	900			45
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	560			28

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'97	55%	11%	05%	+40%
'00	05%	00%	10%	

Total Plants/Acre (excluding Dead & Seedlings)				
'97	1980	Dec:		16%
'00	3280			21%

Chrysothamnus viscidiflorus viscidiflorus																		
Y	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60	13	17	3
	00	11	-	-	-	-	-	-	-	-	11	-	-	-	220	14	14	11
D	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'97	00%	00%	00%	+80%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'97	60	Dec:		0%
'00	300			13%

Purshia tridentata																		
M	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	31	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'97	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'97	0	Dec:		-
'00	0			-

Quercus gambelii																		
Y	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'97	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'97	0	Dec:		-
'00	20			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
Y	97	32	1	-	1	-	-	-	-	-	34	-	-	-	680			34
	00	60	-	-	-	-	-	10	-	-	70	-	-	-	1400			70
M	97	78	19	8	20	4	-	-	-	-	129	-	-	-	2580	13	21	129
	00	135	-	3	47	-	-	1	-	-	184	1	1	-	3720	17	31	186

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'97	15%	05%	00%	+36%
'00	00%	01%	.39%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'97	3260	Dec:	-
	'00	5120		-